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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/638,075	08/11/2000	Hiroji Hanawa	4609 USA/ETCH/DICP	1010
32588	7590	10/11/2005	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			MCDONALD, RODNEY GLENN	
			ART UNIT	PAPER NUMBER
			1753	
DATE MAILED: 10/11/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/638,075

Applicant(s)

HANAWA ET AL.

Examiner

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-24, 27, 28, 30-34 and 36-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-4, 7-14, 20-24, 27, 28, 30-34 and 36-41 is/are allowed.
- 6) ☒ Claim(s) 5, 6 and 15-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 6 are indefinite because the subject matter of these claims does not relate to the "plenum" and does not relate to the "continuous opening in the enclosure extending around the axis of symmetry of the chamber". It is not describe in applicant's specification at least with regard to the plenum embodiment shown in Fig. 29 of Applicant's specification.

Claims 5, 6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the subject matter of these claims does not relate to the "plenum" and does not relate to the "continuous opening in the enclosure extending around the axis of symmetry of the chamber". It is not describe in applicant's specification at least with regard to the plenum embodiment shown in Fig. 29 of Applicant's specification.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 15 is rejected under 35 U.S.C. 102(e) as being anticipated by Shun'ko (U.S. Pat. 6,392,351).

Regarding claim 15, Shun'ko teach in Fig. 3 an enclosure 62 and a workpiece support 64 facing an overlying portion of the enclosure 62. A process region extends there between. The enclosure has at least first and second openings near generally opposite sides of the workpiece support. A hollow conduit 72 connects the first and second openings. A first coil antenna 84 accepts RF power from source 86. A plasma is produced. (See Fig. 3; Column 3 lines 66-68; Column 4 lines 1-41) In Fig. 5 it is suggested to utilize an array of mutually parallel hollow conduits 922. (See Fig. 5)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shun'ko (U.S. Pat. 6,392,351).

Shun'ko is discussed above and all is as applies above. (See Shun'ko discussed above)

The differences between Shun'ko and the present claims is that utilizing an array of antenna coils is not discussed, utilizing an adjustable RF power source is not discussed, utilizing discrete magnetic cores is not discussed and utilizing a single magnetic core is not discussed.

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As to utilizing a plurality of antenna coils since Shun'ko teach utilizing an antenna coil for one tube this leads one of ordinary skill in the art to utilize additional antennas for each conduit.

As to utilizing an RF power source that can be controlled Shun'ko suggest controlling the current to the Rf power source. (Column 3 lines 50-53)

As to utilizing an array of magnet cores since Shun'ko teach utilizing a magnetic core for one tube this leads one of ordinary skill in the art to utilize additional magnetic cores for each conduit.

As to utilizing a single magnetic core for the array of conduits Shun'ko teach that at least one core must be used and this would suggest a single core. (Column 6 lines 20-26)<sup>9</sup>

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Shun'ko by utilizing an array of antenna coils , by utilizing an adjustable RF power source, utilizing discrete magnetic cores and utilizing a single magnetic core as taught by Shun'ko because it allows for producing a uniform plasma.

***Allowable Subject Matter***

Claims 2, 3, 4, 7-14, 20-24, 27, 28, 30-34, 36-41 are allowed.

Claims 5 and 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 2 and 3 are allowable because the prior art of record does not teach the claimed subject matter including wherein the hollow conduit comprises a plenum extending around an axis of symmetry of the chamber and wherein the opening is continuous in the enclosure extending around the axis of symmetry of the chamber.

Claims 4, 13, 14, 20-22, 30-33 and 37 are allowable because the prior art of record does not teach the claimed subject matter including wherein the conduit is formed of a metal material, the conduit having an insulating gap within a wall of the conduit having an insulating gap within a wall of the conduit extending transversely to the torroidal path and separating the conduit into two portions so as to prevent formation of a closed electrical path along the length of the conduit.

Claims 7-12 are allowable because the prior art of record does not teach the claimed subject matter including the coil antenna comprising a second winding extending on an opposite side of and along the conduit.

Claims 23, 24, 27, 28, 34, 36, 38-41 because the prior art of record does not teach the claimed subject matter including the height of the closed torroidal path along an axis generally perpendicular to a plane of the wafer support in a process region overlying the workpiece support is less than elsewhere in the closed torroidal path, whereby to enhance the plasma ion density in the process region relative to the plasma ion density elsewhere in the closed torroidal path.

### ***Response to Arguments***

Applicant's arguments filed September 19, 2005 have been fully considered but they are not persuasive.

#### ***DRAWINGS***

The drawing objections have been overcome.

#### ***35 U.S.C. 112 REJECTIONS***

The 35 U.S.C. 112 1<sup>st</sup> and 2<sup>nd</sup> paragraph rejections have been overcome with the exception of the rejections made to claims 5 and 6. Applicant has contended that claims 5 and 6 have always depended from claim 4 and therefore should not be rejected. It is argued that claims 5 and 6 depend from claim 2 as presented in Applicant's amendment and will continue to be rejected on the grounds set forth above with regard to 35 U.S.C. 112 1<sup>st</sup> and 2<sup>nd</sup> paragraphs.

#### ***35 U.S.C. 102 REJECTIONS***

In response to the argument that Shun'ko do not teach the requirement that the pair of openings be on opposite sides of the workpiece support, it is argued that the language of the claim requires the openings to be near generally opposite sides of the workpiece support. The word "near" causes the Examiner to interpret Shun'ko to have openings "near" opposite sides of the workpiece since near is a relative term.

#### ***35 U.S.C. 103 REJECTIONS***

In response to the argument that Shun'ko do not teach the requirement that the pair of openings be on opposite side of the workpiece support, it is argued that the language of the claim require the openings to be near generally opposite sides of the



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workpiece support. The word "near" causes the Examiner to interpret Shun'ko to have openings "near" opposite sides of the workpiece since near is a relative term.

### ***DOUBLE PATENTING***

The double patenting rejection has been overcome.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM

October 3, 2005